# NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

## FACULTY OF ENVIRONMENTAL SCIENCE

## DEPARTMENT OF ENVIRONMENTAL HEALTH

## MASTER OF SCIENCE DEGREE IN ENVIRONMENTAL HEALTH

## COMMUNICABLE DISEASES

## EEH 5103

**Examination Paper**

**October 2024**

This examination paper consists of 3 pages

**Time Allowed: 3 hours**

**Total Marks: 100**

**Special Requirements: None**

**Examiner's Name: M.W. Mpofu**

INSTRUCTIONS

1. Answer **any four (4)** questions
2. Each question carries 25 marks

MARK ALLOCATION

| QUESTION | MARKS |
|---|---|
| 1. | 25 |
| 2. | 25 |
| 3. | 25 |
| 4. | 25 |
| 5. | 25 |
| 6. | 25 |
| TOTAL | 100 |

**Question One**

(a) Critically analyze the benefits of strong malaria surveillance in the optimization of operations to prevent and control malaria transmission. **[15]**

(b) A new diagnostic test for a disease has the following characteristics: Sensitivity: 85% (the probability that the test correctly identifies those with the disease), Specificity: 90% (the probability that the test correctly identifies those without the disease). Incidence of the disease in the population: 2% (the proportion of the population that has the disease). Assuming you have a population of 10,000 individuals, calculate the diagnostic test's Positive Predictive Value (PPV). **[5]**

(c) Differentiate between emerging and re-emerging communicable diseases. **[5]**

**Question Two**

(a) Explain Pneumonia in children under the following headings

(i) Epidemiology **[3]**

(ii) Risk factors **[3]**

(iii) Methods of prevention **[3]**

(b) What role do social determinants of health play in calculating DALYs for communities? **[9]**

(c) The DALY is an internationally accepted measure of death and disability and is increasingly cited as a powerful tool for decision makers in International Health. Explain why this measure is preferred **[7]**

**Question Three**

a) Regarding the Epidemiological triad of disease causation, discuss the interaction and interdependence of its elements in the cause and spread of communicable diseases. **[15]**

b) Analyse the factors that determine the susceptibility of different population groups to communicable diseases. **[10]**

**Question Four**

Developing countries are said to have a double burden in terms of communicable and non-communicable diseases.

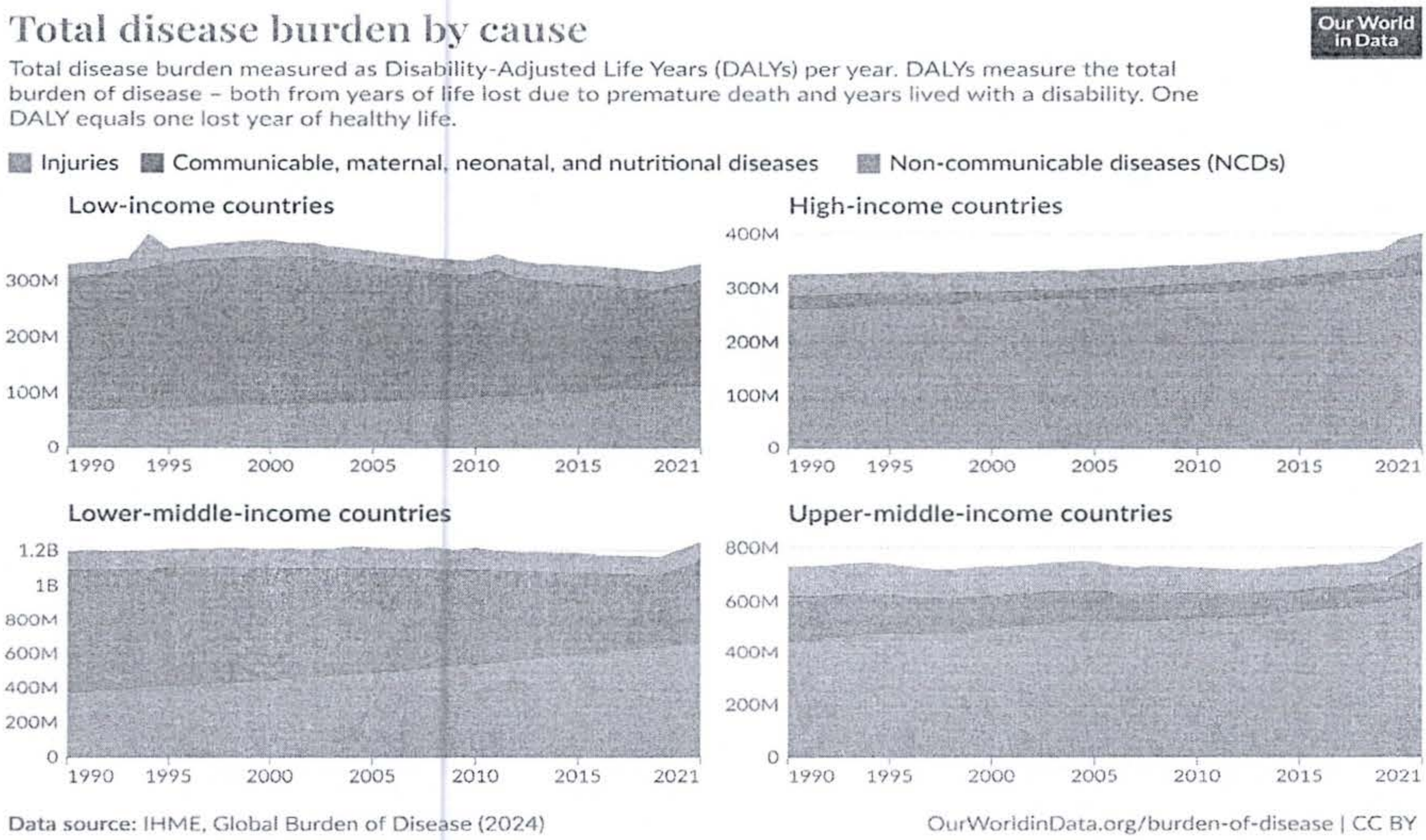
a) Explain this scenario with special reference to Zimbabwe. **[10]**

b) Justify the rationale behind focusing on communicable diseases in such a scenario. **[15]**

## Question Five

(a) Differentiate between prevention and control of communicable diseases. In your answer include the various levels of disease prevention. **[15]**

(b) The chart below shows the total disease burden by cause in relation to income level status categories of countries. It is thereby measuring the distribution of the burden of both mortality *and* morbidity around the world. Discuss the trends shown on the chart and explain the contrasts observed. **[10]**




## Question Six

a) Discuss the rationale behind the Global Burden of Disease project in the measurement of overall disease burden. **[10]**

b) Explain the benefits of measuring the burden of disease using the Disability Adjusted Life years (DALYs) metric. **[10]**

c) One hundred thousand (100,000) adults are stricken for 2 years with a disease that has a disability weighting of 0.6; 20% die at the age 80 years. Assuming the life expectancy is 85 years, calculate the DALY for the given disease and give its interpretation. **[5]**